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PRACTICAL POINTS ON PRIVATE NURSING

IN CHARGE OF
ISABEL MCISAAC

DIPHTHERIA

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(Concluded)

THE question may now be asked, "How is it that diphtheria is cured by nature?"—for we know that nature does in many cases work a cure, and we must be free to admit it. It has been proven by experiments which need not be detailed here, experiments chiefly on the lower animals, that in the animal suffering from a diphtheria toxæmia there gradually develops an antidotal substance to which the name antitoxin has been given. This is just as truly an antidote to the toxin as an acid is an antidote to an alkali. If we know that a patient has taken a poisonous dose of an alkali, we put into that patient's stomach some acid, as, for instance, acetic acid in the shape of vinegar. If we know that the patient has within his body a poisonous dose of diphtheria toxin, it is rational to follow nature's method and give to that patient the antidote in the shape of antitoxin. This is the modern treatment of diphtheria. It is merely an imitation of nature. It has been found that by treating horses by a certain method, by the repeated injections of diphtheria toxins, the blood-serum of these horses develops a large amount of antitoxin. This antitoxin injected into a human being renders him for the time being immune to diphtheria. Then, though the diphtheria germ may lodge on the throat and produce its toxins, these toxins will not produce any of the constitutional symptoms of the disease because of the presence in the blood of this antidote, the antitoxin.

This immunity lasts only for a short time, for a few days or weeks. It has been further found that even though a susceptible person be infected with the diphtheria germ, and have the diphtheritic process fully established in the throat, and the diphtheria toxæmia well advanced, a sufficient amount of antitoxin injected into the circulation may neutralize the effect of the toxin and check the further advance of the local

process in the throat. It can be clearly seen that the earlier this treatment is employed, the better for the patient. The longer the toxæmia has lasted, the greater the changes that have been produced in the heart, nerves, and kidneys; the greater the degree of anæmia, the greater the prostration of the patient. Therefore, it becomes almost an axiom in the treatment of diphtheria that the earlier the antitoxin is applied, the better the prognosis.

The method of using antitoxin is practically the method of giving an hypodermic injection. The serum comes in little glass vials of different strengths and containing varying amounts, which the physician employs, depending on the severity of the case, the age of the patient, the length of time the disease has lasted. If he desires to give the antitoxin to induce immunity, he may give a small dose, two or three hundred units, for the antitoxin is figured by units rather than by drops or cubic centimetres, thus insuring the proper dose, no matter what the degree of strength of the antitoxin may be. If the disease is already present, he may give a thousand units or fifteen hundred units, which is perhaps the average dose administered, or in severer cases, and particularly those far advanced, the initial dose may be two or three thousand units or even more. He may repeat the dose in twelve or twenty-four hours, as may seem best. In administering the remedy the greatest care is to be exercised that the little operation is done under aseptic precautions. The field of operation—that is, the skin—is sterilized in the usual manner by soap, water, and alcohol; the needle and the syringe must be thoroughly cleansed, and syringes are commonly constructed so that sterilization by boiling can be secured; the hands of the operator and the nurses who assist, the towels, the cotton,—everything that is employed,—should be thoroughly cleaned. The fluid is drawn up into the sterile syringe and the injection is made into the subcutaneous tissue, great care being taken that it is not made into or between the layers of the skin. The point selected varies, some preferring to inject between the shoulder-blades, and others preferring the back or side of the hip or back of the thigh. The injection, as a rule, causes but slight pain. The slight wound is sealed with cotton and collodion, and the patient is not allowed to pick or scratch at the cotton or to lie upon that portion of the body, as the skin is sometimes a little reddened and irritated after the injection.

One caution may be given here regarding the injection. The manufacturers have reported that some specimens of antitoxin have been returned to them as poor, because, when about to be used, they were found to be muddy, and often somewhat thick. It has happened in some of these cases at least that the nurse or the physician has used the syringe

immediately after it has been sterilized and when it is very hot. The serum drawn into the hot syringe has its albumin coagulated, and this renders it muddy. The syringe should, therefore, be cold, or at least cool, when it is used. And no alcohol should be allowed to remain in the syringe, as this also may coagulate the antitoxin.

In cases where the antitoxin works favorably the good result will usually show within a period of from twelve to sixteen hours. There is a lowering of the temperature, an improvement in the pulse and general condition of the patient, and on examining the throat it is found that the membrane has not spread, and that there is a tendency for it to curl up at the edges. Within another twenty-four hours it may have entirely disappeared. The change that is wrought in a severe case of diphtheria by an injection of antitoxin is little short of marvellous. A child that was dull, stupid, perhaps slightly delirious, with rapid, feeble pulse, high temperature, with swollen neck, rapidly-spreading membrane in the throat, is in twenty-four hours converted into a bright, intelligent child with normal temperature, pulse of diminished rapidity, and with the swelling in the neck lessened, and the membrane, if it has not entirely disappeared, at least showing a tendency to slough.

Those who have had the greatest experience with the antitoxin are those who are loudest in its praise. Those who have had but a slight experience, perhaps using a poor preparation of antitoxin and using it in too small doses, using it late in the disease, have met with less favorable results and are prejudiced against it. The prejudice of those who have never employed it at all should scarcely be considered. The reasons for failure are the late employment of the remedy, mixed infections, that is, mixed septicæmias and toxæmias, and possibly some idiosyncrasy of the patient that we do not know about.

This, in brief, is the modern treatment of diphtheria, and yet, while the physician of to-day leans heavily on antitoxin and feels that in it he has a remedy that really acts as a specific, he should not forget that the older methods of treatment are not to be overlooked. Thus, attention should still be directed to the throat, for, while he cannot hope to destroy all the germs or prevent the absorption of the toxins, it is possible that he may destroy by antiseptic gargles, sprays, or swabs many germs, and thus lessen the amount of toxin that is manufactured. Physicians differ very much in their preference for local applications, some preferring that the application be made with a swab in spite of the struggles of the child, and others, and as it seems more wisely, preferring the spray to the swab, especially if the child is nervous and struggles and fights every time an application is made to the throat.

It is not the purpose of this article to advocate any one special drug

in the local treatment of diphtheria, and the nurse in performing her duty simply carries out the directions of the attending physician. Local applications to the outside of the throat are frequently made, either in the shape of cold, which would seem preferable, or in the shape of hot fomentations, which relieve the pain and sometimes seem to take down the swelling. With the fear of cardiac failure, it is clear that the patient should be kept quiet in bed, and wherever there is a tendency to irregularity of the pulse, and when for some unaccountable reason the pulse becomes slow, often unnaturally slow, dropping to 40 or 50, absolute quiet should be insisted upon, as these are warnings that the heart is weak and may give out suddenly.

The nourishment question is a problem which is often difficult to solve. In many instances the patient with no appetite, with perhaps nausea and pain on swallowing, is rather difficult to feed, and yet feeding in a prolonged case is of the utmost importance. This taxes the ingenuity and patience of the nurse to the utmost. As a rule, the nurse, with tact and perseverance, will be able to get her little patient to take milk or whatever food may be selected. In some cases of prolonged disease, particularly where post-diphtheritic paralysis ensues, it may be necessary to resort to feeding by the stomach-tube or the nasal tube, although these cases are rare.

The care of the skin, the sponging for temperature, the attention to the bowels, will be the same in diphtheria as in any other acute fever. Realizing the importance of elimination, we see how necessary it is that the skin should be kept clean and that the kidneys and bowels should be kept open. It is certainly a good rule in cases of diphtheria to allow the patients plenty of water, as the kidneys are thereby flushed out, and they tend to carry off the toxin of the disease.

The question is frequently asked, "How can a nurse taking care of a patient sick with diphtheria best avoid contracting the disease herself, and how can she prevent the spread of the disease to other members of the family?" While there is no space to go into details, one may say that if the nurse fully realizes the nature of the disease—that it is due to a micro-organism, that that micro-organism is in the throat and nose of the patient, that every bit of membrane, that every bit of discharge from the nose, that the saliva, and even the air that is exhaled in the act of coughing, may contain numerous micro-organisms—she will be ingenious and devise means of preventing the spread of the disease and the danger of contracting it herself. She will be as anxious about the sputum and nasal discharges as in cases of tuberculosis. There will be sputum-cups that can be emptied and thoroughly sterilized, or there will be bits of cheese-cloth that can be burned, instead of the handker-

chief or towel that the parents may prefer to use. The clothing of the patient and the bedclothes will not be allowed to go to the general wash. The dishes, knives, forks, etc., will be washed in the room, or will be boiled thoroughly before being put with the other table utensils. The members of the family will be kept from the patient as far as possible, and where practicable a separate room with good ventilation will be secured. A sheet, covered with some antiseptic, should be hung up in front of the door to catch particles of dust that might be carried out into the hall or other rooms by the current of air. The little patient will thus be practically quarantined together with his nurse.

If the nurse will remember two simple directions, she will avoid the greatest danger of contagion. One is, not to let the patient cough or breathe into her face. The other is, not to touch herself with her hands, that have been in contact with the patient, until they have been thoroughly washed and in this way sterilized. There can be no question that most cases of diphtheria arise from actual contact of the particles of membrane from the throat of the patient with the body of the healthy individual. This contact occurs either by the act of coughing or by the membrane being brought to the body of the healthy individual by the hands or fingers.

In this short portrayal of the subject of diphtheria there is much that is old. It is the same old disease that it was decades ago, with the same local manifestations in the throat, the same constitutional symptoms, the same danger of heart failure, the same tendency to post-diphtheritic paralyses, the same danger to others; but viewed in the light of modern pathology and bacteriology, the entire disease takes on a new and different aspect. It is viewed from a different stand-point, and with the modern conception of the disease we see more clearly the dangers and can more readily avoid them. Furthermore, with antitoxin the physician of to-day feels as though he had a weapon that can cope with the deadly microbe of this terrible disease.

